

research bulletin

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DWARF CARNATION RESPONSE TO MULTIPLE SPRAY APPLICATIONS OF SUMAGIC™

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Single (0.2 mg a.i. per pot) and multiple foliar applications (0.05 mg a.i. per pot, four times) of Sumagic™ (uniconazole) provided high quality, compact, dwarf carnation plants 4 to 5 inches shorter than the controls. Even though the height differences due to growth retardant treatments were statistically significant, (0.5 inch), in practice, the differences were not evident.

INTRODUCTION

The growth retardants marketed today are much different than the first nicotianum compounds used in 1949 to reduce stem elongation. The first group, Amo 1618, Phosphon-D and Phosphon-S are no longer available; they have been replaced with more effective growth retardants such as Cycocel™ (1960), B-Nine™ (1962) and A-Rest™ (1969). All growth retardants developed to date, have been used with varying degrees of success on different plant species. In order to obtain the desired responses with these growth retardants, plants have often required double or multiple applications, which are time consuming and costly.

The newest growth retardants, Bonzi™ (1985) and the experimental product Sumagic™ are chemicals that can be applied in a single application and at the proper rate, provide high quality, short, compact plants (6,7,3,4,5). In addition there have been no reported deleterious effect on flower formation or leaf color even when applied at high rates (1,4,3,5). Based on the Colorado State University growth retardant research to date, Sumagic™ and Bonzi™

are the main growth retardants that can be effectively used to "tone" Colorado Majestic Mountain™ dwarf carnations. Previous studies determined that single concentrations of 15 to 20 ppm a.i. of Sumagic™ or Bonzi™ provided high quality short, compact pot carnations (3,4,5).

The objective of this experiment was to determine if there would be any differences in plant height, compactness and total appearance of dwarf carnations treated with a large single dose or small multiple doses of Sumagic™.

MATERIALS AND METHODS

The experiment was conducted in a fiberglass covered greenhouse heated to 54 F night and 62 F day, in an atmosphere enriched with 600 to 1000 ppm CO₂ during daylight hours and watered with a continuous feed program described by Hanan (2). Well rooted dwarf carnation cuttings of 'Snowmass' were planted in 4-inch azalea pots on 11 October 1988 using medium consisting of 1 soil, 3 sphagnum peat, 2 No 6 perlite (v:v:v) and then placed on a single greenhouse bench at a density of 4 plants per sq.ft. One week after potting, the upper six nodes were removed (pinched), leaving three to four leaf pair on the remaining plant. After pinching, plants were allowed to develop until lateral shoots were 3 to 4 inches in length. Sumagic™ treatments were applied as a foliar application on 11 Janu-

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ary 1989. The treatments consisted of a single application of 0.2 mg a.i. per pot (10 ml of 20 ppm a.i. Sumagic™ solution per pot) and 0.05 mg a.i. per pot (10 ml of 5 ppm a.i. Sumagic™ solution) made four times at weekly intervals. Control plants were sprayed with tap water. Lateral shoot length, flower diameter and days to flowering were recorded when at least one flower was fully open and two buds were showing color on week 21 after pinching. The experimental design was a randomized block with six replications having seven plants each.

RESULTS

Dwarf carnations treated once with 0.2 mg a.i. of Sumagic™ per pot and four times with 0.05 per pot were significantly shorter (4 to 5 inches) than untreated plants. Observations made during all growth periods following the treatments showed that plants treated with the single application of 0.2 mg a.i. Sumagic™ were initially shorter than those treated with multiple applications of 0.05 mg a.i. The longer the time after the initial spray applications, the differences in plant height responses began to disappear. At the conclusion of the experiment, plants treated with multiple applications of 0.05 mg a.i. Sumagic™ were significantly shorter (0.5 inch on average) than plants treated once with 0.2 mg per pot (Fig.1). Plants in both Sumagic™ treatments were compact, with well developed foliage and had many buds and flowers. There were no differences in the flowering of treated and untreated plants. Even though the height differences of the dwarf carnations were statistically significant due to growth retardant treatments, in practice visual differences were not evident (Fig.2). A dwarf carnation producer therefore has an option of applying single or multiple doses of Sumagic™.

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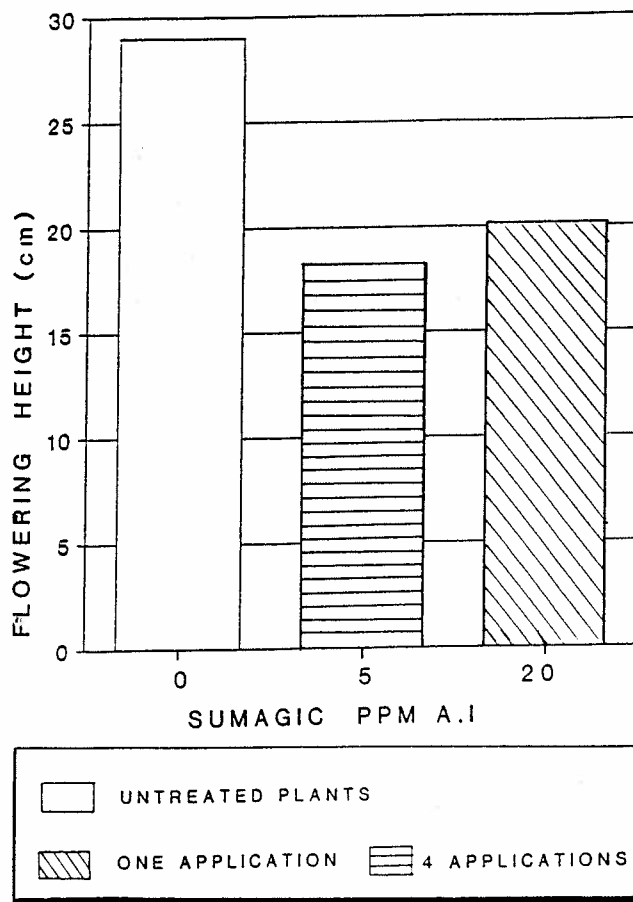


Figure 1. Colorado Majestic Mountain Carnations 'Snowmass' treated with Sumagic™ doses of 5 ppm a.i. (0.05 mg per pot) four times and single does of 20 ppm a.i. (0.2 mg a.i. per pot), compared to untreated plants.

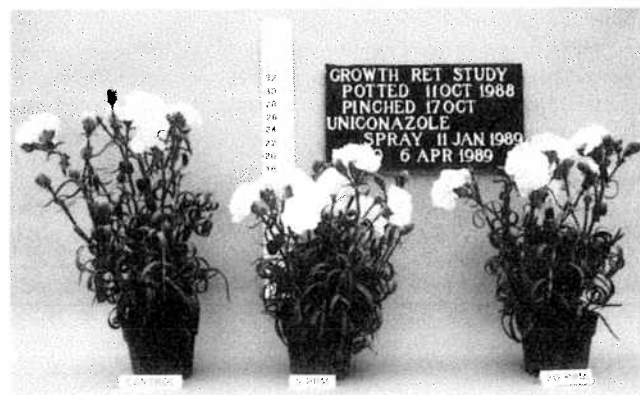


Figure 2. Height at flowering of Sumagic™ treated dwarf carnations Colorado Majestic Mountain Snowmass. (L)- untreated plants; (C) Four applications of 5 ppm UCZ (0.05 mg per pot); (R) Single 20 ppm UCZ (0.2 mg per pot) application.